Willingness to Pay for Conservation in Moyo Satonda National Park, Indonesia: Sumbawa & Dompu Regencies

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ABSTRACT: Moyo Satonda National Park (MSNP) is one of the attractions in NTB, Indonesia that needs attention for conservation. A contingent valuation method of survey was conducted to estimate the conservation value of MSNP and to elicit the willingness to pay among respondents. Through the random survey, the estimated mean of willingness to pay for conservation fee per respondent was IDR 7.81. With the number of visitors of 4000 in year 2022, it is estimated that there is an additional IDR 31,240 (2.03 USD) that could be used for the improvement in environmental conservation. This study shows that contingent valuation method (CVM) is a useful tool to guide decision makers in policy purposes of natural resources management of protected area in developing countries.

KEYWORDS: Contingent Valuation, National Park, Willingness to Pay

1. INTRODUCTION

The conservation of natural resources is a critical aspect in maintaining the ecological balance and sustainability of any region. It is widely accepted that biodiversity loss and poverty are linked problems and that conservation and poverty reduction should be tackled together. However, success with integrated strategies is elusive. There is sharp debate about the social impacts of conservation programs and the success of community-based approaches to conservation (Adams et al., 2004). Underpinning conservation policy (regulatory decisions) and practice (on-the-ground decisions) with rigorous scientific evidence can be vital for efficiently solving environmental problems (Pullin & Knight 2001; Sutherland et al. 2004). There are many barriers to using science to inform conservation policy and practice. Conservation scientists wishing to produce management-relevant science must balance this goal with the imperative of demonstrating novelty and rigor in their science (Cook et al., 2013). Protected areas throughout the world are key for conserving biodiversity, and land use is key for providing food, fiber, and other ecosystem services essential for human sustenance (Defries et al., 2007).

The Ministry of Environment and Forestry (LHK) of Indonesia, has designated Moyo and Satonda Islands on Sumbawa Island, as National Parks. Currently, West Nusa Tenggara (NTB) Province has three National Parks. This determination is in accordance with the Decree of the Minister of Environment and Forestry of the Republic of Indonesia, number SK.901/MENLHK/SETJEN/PL.2/8/2022, concerning changes to the main function of the forest area from the Moyo island hunting park area, the Moyo island marine nature tourism park and the natural tourism park on the island of Satonda, which became the Moyo Satonda National Park in Sumbawa and Dompu Regencies, NTB Province. The area is approximately 31,200.15 Hectares despite its importance, MSNP faces challenges such as habitat degradation, introduced species, and insufficient funding allocated towards its conservation. Therefore, sustainable financing mechanisms must be identified to adequately support the park's conservation efforts (Hernawardi., 2022). Willingness to pay (WTP) is a widely used concept in the field of environmental economics to estimate the monetary value that individuals place on the preservation of environmental goods and services (Arrow et al., 1993); (Hanley et al., 2009). The contingent valuation method (CVM) has been employed extensively as a tool for estimating WTP for various non-market goods, including national parks and biodiversity conservation efforts (Mitchell & T. Carson, 2013); (Bateman & Großbritannien, 2002).

Several studies have successfully applied CVM to determine WTP for conservation measures in protected areas across different regions globally, (Gelcich et al., 2013); (Zhang et al., n.d.) & (C. Adams et al., 2007)..

Moyo Satonda National Park is one of the most visited national parks in Nusa Tenggara Barat (NTB). The parks and nature reserves highlight the park's natural heritage and serve as a major draw for NTB's burgeoning tourist economy. It is worthwhile for visitors to MSNP to experience the delightful feeling of a variety of stunning waterfalls, including the spectacular Mata Jitu Waterfall on

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Moyo Island. For the parks to become international destinations, the country and the parks must have a global image of being a premier destination for outdoor recreation and nature tourism. Significant natural resources, a high market profile, and a quality service industry are three prerequisites for effective utilization of the international market (Eagles, 2002).

MSNP has an entrance fee IDR 5000 for locals and IDR 35000 for international visitors, it has drawn 4000 tourists in 2022. The money received from the entrance fees is now controlled by the Conservation Bureau of West Nusa Tenggara and is utilized for the management and preservation of the national park, including wildlife and environmental protection. The entrance fee for Moyo Satonda National Park may not be enough to cover the cost of conservation and management due to several factors. These may include the park's large size and the need for specialized equipment and personnel for conservation efforts, the cost of maintaining and improving park infrastructure, and the possibility of natural disasters or other unforeseen events necessitating additional funding. Furthermore, the entrance price may not be enough to pay the costs of long-term conservation and management methods, such as research and teaching programs, being handled a nature reserve is classified as a nonmarketable good. It is extremely difficult to assign a monetary value to these nonmarket environmental products since there is no price structure in place for them. Meanwhile, some locals and international visitors are less conscious of national park protection because they did not have to pay any entrance fees. Following that, it is vital to persuade the people, the public, and other stakeholders of the importance of national park protection by assigning a monetary value to it (Eagles, 2002).

Hence, this study aims to employ the CVM to investigate the willingness to pay for conservation in Moyo Satonda National Park among respondents. Using a random survey, the mean WTP will be elicited, and an estimate of potential additional funds for environmental conservation will be proposed. Furthermore, this research intends to contribute valuable insights on the efficacy of CVM in informing policy decisions for protected area management in developing countries like Indonesia.

2. METHOD

The research was based on a random survey of 86 participants from the Moyo Satonda National Park (MSNP) in Sumbawa and Dompu Regencies, NTB Province, Indonesia. The data were collected from 86 respondents by conducting face-to face interviews using a structured questionnaire to assess their demographic characteristics and willingness to pay for conservation fees at the Moyo Satonda National Park(MSNP) in Sumbawa and Dompu Regencies, NTB, Indonesia. Descriptive analysis is used to provide information on socioeconomics variables such as ages, education level, level of income, and gender of the respondents. In order to gain the first research objective, regression analysis is used because it shows the relationship between the dependent variable and independent variables. This method will allow the effect of independent variables, onto dependent variables, whether it has a positive or negative relationship, and revealing which factors (independent variables) affects WTP (dependent variable) the most. Furthermore, CVM is used to discover how the respondents' willing to pay for conservation of the park similar with second objective of this research. This approach is called an open ended question. The respondents will be asked generally how much they are willing to pay for conservation fee. All of these respondents showed their WTP for conservation.

3. RESULT AND DISCUSSION

3.1 Respondents Profiles

Descriptive analysis was performed to examine MSNP demographic and characteristic responses. All data would be expressed as a percentage (%) and frequency. Table 1 summarizes the demographic characteristics of respondents. Half of the respondents (54.6%) were male. More over half (62.7%) were single. The majority of respondents (50%) were between the ages of 20 and 29; the remaining age groups were 13-19 (11.6%), 30-39 (19.7%), and 40-49 (6.9%°). The majority of answers (65.5%) were international, with the remainder (34.4%) being domestic. In terms of educational background, 58.1% possessed degrees. 11.6% of those polled have a diploma. The majority of responders (30.2%) were from either Mataram or Universitas of Indonesia students, while the remaining 18.6% were government employees. In terms of money, the bulk of tourists (93%) earned less than RP 5M while the remaining (14%) did not have any income.

Table 1: Respondents Profiles

Characteristics	Percentage(%)	N
Gender		
Male	54.6	47
Female	45.3	39
Marital status		
Single	62.7	54
Married	37.2	32
Nationality		

Indonesia	34.8	30
International	65.1	56
Age		
13-19	11.6	10
20-29	50	43
30-39	19.7	17
40-49	6.9	06
>50	11.6	10
Education Level		
Master Degree/PhD	58.1	50
Bachelor Degree	24.4	21
Diploma	11.6	10
Secondary/Primary School	5.8	05
Occupation		
Self-employed	27.9	24
Government-servant	18.6	16
Student	30.2	26
Private-employed	23.2	20
Monthly Income		
<IDR5M	93	22
IDR5M-RP10M	45.3	36
IDR10M-RP30M	31.3	05
>IDR30M	4.6	14
Don't have any Income	14	09
Members of any environmental organization		
Yes	65.1	56
No	34.8	30

3.2 Linear Regression Analysis

The association between Willingness to Pay for Conservation and the independent factors (Demographics) was predicted using regression analysis. The achieved result is shown in Table 3. According to the Model Fit Measures in Table 3, the value of R Square is 0.913, indicating that the linear regression model explains 91.3% more than half of the behavior of the dependent variable. However, the remaining 8.7% is influenced by factors not included in this study.

According to the theoretical framework of this study, there is considerable evidence that WTP for conservation is positively impacted by education level, adversely by gender, and negatively by nationality. This finding is significant at the 1% and 10% levels. This indicates that when they spend more time learning (education Level), their willingness to pay (WTP) increases. More specifically, a one percent increase in years of schooling would raise WTP by 0.2013 percent on average. This outcome shows that it will expand their knowledge and may eventually have an influence on a reasonable person's thinking. This will usually mold their view and attitude in a more mature way. Since what they learn becomes ingrained in them as a person, the impact of education on them conduct is typically extremely substantial, particularly if it is aligned with their viewpoint, such as the WTP.

As a result, a negative connection between WTP and gender was discovered. The negative sign of the gender coefficient indicates that male respondents are more likely than female respondents to pay the WTP for conservation, with a 0.4685 percent difference in amount. Interestingly, a negative sign of nationality indicates that, on average, people from "Indonesia" have a lesser readiness to pay than those from the "International" group. However, no significant variations in WTP were detected among respondents based on marital status, occupation, or age.

Table 3: Linear Regression

Model Fit Measures

			Overall Model Test			
Model	**R**	**R²**	**F**	**df1**	**df2**	**p**
1	0.955	0.913	138	6	79	< .001

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Model Fit Measures

Model	R	R²	Overall Model Test			
			F	df1	df2	p

Model Coefficients - WTP

Predictor	Estimate	SE	95% Confidence Interval		t	p
			Lower	Upper		
Intercept	-0.4037	0.211	-0.8236	0.0163	-1.913	0.059
Gender	-0.4685	0.203	-0.8725	-0.0644	-2.308	0.024
Marital Status	0.7486	0.206	0.3387	1.1585	3.635	< .001
Nationality	-0.0436	0.181	-0.4037	0.3165	-0.241	0.810
Education Level	0.2013	0.144	-0.0855	0.4880	1.397	0.166
Occupation	0.5047	0.116	0.2741	0.7353	4.356	< .001
Age	0.3962	0.117	0.1635	0.6288	3.390	0.001

Table 4: Public's WTP

IDR	N	Percentage
1-2	4	4.6
3-4	11	12.7
5-6	16	18.64
7-8	23	26.7
9-10	10	11.6
11-12	07	8.1
13-14	04	4.6
15-16	06	6.9
17-18	02	2.3
18-19	02	2.3
>20	01	1.1

Table 5: Public's WTP (Mean)

Respondents(n)	Conservation fee(IDR)
86	7.81

Table 6: Estimated Revenue from conservative Fee

Year	Estimated additional revenue(IDR)
2022	31,240

4. CONCLUSION

It can be inferred from this study that most the respondents are willing to pay for conservation fee at MSNP. The park possesses a majestic aura worthy to be conserve and protect so that future generation can continue to enjoy and appreciate its beauty.

As indicated by the study, the results obtained in regression can be used input in the planning process and managerial policy implication. The results of the study showed that the willingness to pay for conservation fee are in fact positively influenced by

respondents' education levels while gender and nationality also play influential roles. This study revealed that respondents with a high education level are willing to pay more for conservation fee. Conservation Bureau of West Nusa Tenggara should implement education program, aimed to raise awareness among those who haven't visited. Respondents, who are well informed about the park, cultivate a more positive viewpoint and disposition regarding the conservation fee, the inclusion of this research strengthens the credibility of the management plans and the management team of the park can use it to justify any changes such as an increase in fee to the authorities and the public.

5.   AUTHORS' BIOGRAPHY

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